THE UNIVERSITY OF NORTH CAROLINA
AT GREENSBORO
GREENSBORO, NORTH CAROLINA

HONORS PAPERS
1966/67

Greensboro, North Carolina
1967

CONTENTS

CONTENTS (continued)

THE CONCEPT OF SPACE AS SEEN IN JAPANESE HORIZONTAL ARCHITECTURE AND IN ROMAN VAULTED ARCHITECTURE

by

Elizabeth C. Helsing

Submitted as an Honors Paper
in the
Department of Art

The University of North Carolina
at Greensboro
1967

Approved by

Director

Examining Committee

Table of Contents

The articulation of space by man is the essence of architecture. In the creation of an architectural form, space must be modified, broken up, the result an interior area distinct from the surrounding exterior. The horizontal form found in traditional Japanese house construction and the development of the vault in the first and second centuries of the Roman Empire are indicative of two approaches to the creation of an interior space in which man can move and function. In each case the space which has been created is flexible, encouraging the imaginative use of forms and arrangements; yet binding the construction into a co-ordinated, comprehensive whole. The Japanese house is built around the arrangement of the tatami[1] or floor mat. No room in the house has the same mat arrangement, nor does an arrangement cover more than one room, but the use of a standard floor covering precludes an interruption in the flow of one room into another when the rooms are open. The size and shape of a room can easily be determined. Rooms can be added where they are wanted with little trouble, and can generally be arranged in any order. The use of most rooms is not predetermined, and thus the room can be used

---

[1]The tatami or straw mat measures approximately 3' x 6'. A Japanese room is planned to hold a certain number of mats in a particular arrangement. See Morse, Edward S. Japanese Homes and Their Surroundings, (New York: Dover Publications, 1916), pp. 121-125.

during the day as a living-dining area and at night as a bedroom. Furniture is carried in when it is needed. The building of a house is a creative process, a molding of similar parts into a concentric whole. Each house is fresh, different although the formula for its building was developed centuries ago.

The integration of Roman architecture is based on the repetition of a form concept rather than on the continuous use of a standard module. The development of Roman Imperial architecture is the development of the vault. This structure best fulfilled the demand for monumental architecture within the bounds of Roman technology. With the perfection of the poured concrete vault, an entirely new concept of architecture emerged. This was architecture on a monumental scale, built for the pleasure of Roman emperors, subject to their whims and search for novelty. Although the new architecture adhered to the principles of symmetry basic to ancient Roman building,[2] the traditional building forms were abandoned. With the use of the arch and vault, the repertory of architectural shapes was vastly expanded. The architect was no longer limited to what could be built within the limits of horizontal timber and stone constructions. Topped by a vault, in this new architecture, one form

---

[2]For a description of the traditional Roman house arrangement see Nash, Ernest, Roman Towns, (New York: J. J. Augustin Publisher, 1944), pp. 14-16.

flowed into another. The size and extent of a structure was theoretically limitless. What was to be built could be in part mass produced, as the final structure was a combination of similarly shaped forms. The form could be any size and the possibilities of combination were limited only by the imagination of the architect. The results were a free-flowing form, an articulation of space held together by great arching vaults which carried one space into another.

With the development of the vault, the concept of inside space in the Roman world was thus radically changed. In Domitian's Domus Flavia room flowed into room. The traditional boxlike room was opened up and elongated. Columns instead of walls separated these new open spaces. Visually the space was freed from the confinements of solid wall and low, flat ceilings. Barrel vaultings relieved the sense of weight and mass of the structure. Inside and outside, though, were still as they had been traditionally, two distinct and separate ideas. In general the outsides of the buildings remained solid and closed, physically and visually. Only the interior was thrown open, but even that not entirely. Beyond the columns, and false windows the walls were solid, massive stone. Light flickered in from clearstory windows high above the heads of those who walked between the columns. It glinted on the mosaics and marble chips dematerializing the surfaces of the piers which supported the vaults. Frescoed scenes, half-hidden behind

screens of columns, lent false depth to narrow corridors. Niches created deep shadows in the unsure light which filtered down from overhead. An illusion of freedom and spaciousness was created, but it was only an illusion. The massiveness of the exterior reflected the tightening control of the emperors on the Roman people.[3] The freedom of the state was as illusory as the openness of the palaces.

Roman architecture was space shaping, but it was also space bordering. The interior was deliberately cut off from the exterior. The architect could control only the interior space. He could not shape what was on the outside, and thus he tried to create an exterior space within the interior space. He tried to create a total space, out of which man had no need to step. The forum was a product of this idea. A wide flat area was generally chosen as a site for building the forum. On such a plain man could arrange buildings where he desired and at the height he chose. He could set his temples on artificial mountains, plant paved valleys with forests of columns, and fill fountains with cool mountain water. In this setting a man could seek shelter from the sun, keep his cloak and feet dry during a shower, mount a marble mound to deliver a speech, and not be surrounded by walls. This,

---

[3]Nero's Domus Aurea was one of the first imperial mansions built at the expense of the Roman people. See Boethius, Axel. The Golden House of Nero: Some Aspects of Roman Architecture, (Ann Arbor: The University of Michigan Press), pp. 126.

though, could not be called natural space. The forms of a landscape--mountains, valleys, rivers--had been formalized and placed within the context of an interior space of paved floors, steps, and walls with gates which enclosed the entire area. The motifs of nature were stylized. Nature was not ignored but was shaped and controlled at the designer's discretion.

A totally different concept of space can be seen in the traditional Japanese house.[4] It is completely integrated with nature. Natural space and architectural space are blended in perfect harmony into a unified whole. The architecture is at peace with nature. Thus, it was with the Heian aristocrats who conceived these architectural forms. The aristocrats of the Fujiwara court had no quarrel with nature. Man experienced and accommodated nature, yet he did not submit himself unprotected to its forces. The general construction of the house evidences that the Japanese architect took advantage of any opportunities which nature offered. Neither climate nor geography was ignored. The early Japanese architects created an extremely practical and livable architectural form. Basically, the house was designed to lessen the

---

[4]This is the shinden-zukuri style of house construction which developed during the Heian period. For the history of the style see Tange, Kenzo and Noboru Kawaga. Ise, Prototype of Japanese Architecture, (Cambridge, Mass.: M. I. T. Press, 1965), p. 169, pp. 200-206.

effects of a hot, humid summer.[5] The design is such that in the summer the house can be flung open allowing air to circulate and cool the interior. The construction of the house was kept light and above ground. The deep overhang of the roof, though, does not prevent the heat from the low winter sun from warming the interior of the house. The staggered placement of the rooms permits circulation of air in the summer and allows the sun to enter in the winter. Unlike Roman construction forms which were generally hidden, the details of Japanese construction were aesthetically pleasing as well as practical. Materials were carefully selected for natural beauty. Construction was not disguised; good craftmanship was highly esteemed. Visual effects were produced from the beauty of the wood, the clarity of construction, and simplicity of design.

The idea of natural space was preserved in a Japanese house. This is not to say that the interior could not be distinguished from the exterior. The interior of the house is a true interior space, but it is positively related to the natural flow of exterior space. Rooms open into other

---

[5]Yoshida Kenko, (1283-1350), Japanese poet and Buddhist hermit monk writes of the summer, "In building a house one should think above all of the summer. In winter one can live anywhere, but there is nothing worse than a house which proves to be unsuitable for the hot season . . . ." Yoshida, Tetsure. The Japanese House and Gardens, (New York: Frederick A. Praeger, 1955), p. 12. For a discussion of the demands of climate of Japanese architecture see also pp. 14-16.

rooms which open onto a veranda. The wood planks and stone steps of the veranda directly relate the garden to the inside of the house. Interior space flows freely and is never completely closed to the outside or other interior space. Light filters in through the shoji at eye level and trees cast shadow patterns on the paper walls of the house. Even indirectly, the exterior world remains in an intimate relationship to the interior. A physical freedom of space is established which is not eliminated when a room is shut off from other rooms and the outside. The exposed structure of the roof leads the eye into the space of another room. The shoji, the fusuma,[6] the continuous pattern of the wallpaper all intimate a greater space than that of the room. The scale and materials of the interior of a room or house suggest a larger, universal space. This allusion to a larger space can be translated into a world physically attainable by opening a shoji and stepping from the inside space of the house onto the veranda and down the steps into the garden.

The exterior of a Japanese house is not a facade in the Roman sense. The windows and doors of a Japanese house open onto a garden which tempts those on the inside to come outside; to walk in the garden, not only to

---

[6]The shoji is the outside door-sash covered with thin paper. The fusuma is a sliding screen between rooms. See Morse, cited above, pp. 130-133; pp. 125-129.

see it, but to experience the space which has been carefully planned.[7] Every point of a Japanese garden is carefully determined. Each rock and tree is selected for its unique shape and so placed to bring out the beauty of the individual object within the context of the rest of the garden. The vistas are controlled. The extent of this control, though, is not obvious, but is always subdued and never confining. Again the sense of space is expanded rather than limited as Roman space is limited. The solidness of the Roman brick wall precludes any relationship between the space inside the building and the surrounding exterior space. Pliny speaks of the trees and meadows which surround his Laurentum villa and finds them pleasing,[8] but the natural environment is generally incidental to the villa itself. They surround the villa but are not a part of it, and are in no way an extension of the space which is suggested by

---

[7]Garden planning was a task for an aristocrat and a gentleman. The following is a comment from Memoranda of Garden Making, written during the 12th century: "The character of the terraine must be taken into consideration in laying out the pond. Special care must be taken to produce fine feeling at the points where the observer's eye is naturally directed. The design should be chosen in such a way, as to make the observer feel it could not possibly have been otherwise; that is, as if nature itself produced the garden." Kuck, Loraine E. The Art of Japanese Gardens, (New York: The John Day Co., 1940), p. 61

[8]Pliny the Younger refers to the natural environment of his villas, but the reference seems to be merely description rather than a particular interest in the landscape as an integral part of the buildings. See Tanzer, Helen H. The Villas of Pliny the Younger, (New York: Columbia University Press, 1924), p. 15.

the great barrel vaults on the interior of the building. A tree as found in nature had no place in the Roman architectural scheme. The space in which a Roman moved was the space which could be created artificially. The buildings were of man-made materials--concrete, plaster, brick, glass mosaics. The shapes created were those conceived from the world of geometric forms and perfect symmetry.[9] Order was synonymous with symmetry. What was natural was therefore disorderly and was either to be changed or suppressed.

The natural, though in Japan, was to be considered disorderly only when compared to the symmetry of geometric forms and mathematical proportions. The Japanese in their building sought the order which can be found in nature. Their architectural forms are based on the principle of assymmetry and balance rather than a strict application of mathematical proportions.[10] The house is integrated with nature by following laws derived from natural order. To dwell in a Japanese house is to experience nature in the

---

[9]Vitruvius listed those principles of symmetry on which Roman architecture through the reign of Augustus, was based. See Vitruvius. The Ten Books on Architecture. Morris Morgan, trans. (Cambridge: Harvard University Press, 1962), pp. 13-14, pp. 74-75.

[10]The bases for the principle of assymmetry and balance can be found in the still, resigned elements of the Yayoi principle and the rebellious, dynamic elements of the Jomon principle. See Gropius, Walter, Kenzo Tange, and Yasuhiro Ishimoto. Katsura, Tradition and Creation in Japanese Architecture, (New Haven: Yale University Press, 1960), pp. 16,31.

sense that man has not tried to conquer natural order, but has adapted himself to it, and in so doing nature is rendered beautiful, peaceful, and idealized. The house itself was constructed from natural materials. Wood was selected for the beauty of the grain. It was left unpainted and unwaxed, but was highly polished to bring out the color and texture of the piece. The plaster used on the walls was not painted in bright scenes and colors but was left its natural color. A plum branch, a piece of pottery provided a touch of color, but the inhabitant of the house himself in his bright kimona completed the room. The house, carefully structured to follow the natural order of the universe, was a backdrop for the actions of man. The neutral colors and low horizontal forms were never intended as a completed room without the presence of man.

Although the neutral tones of the Japanese house are soothing and unobtrusive they are not static. There is a natural vitality inherent in the Japanese house. This vitality is the life force found in the components and materials from which the house has been constructed. The natural grains of the timbers are important, and wood is carefully cut and selected to preserve the mark of the grain in the finished house. The tatami are changed often to keep even an old house smelling fresh and clean. The slick-lumpy texture of bamboo is important in the creation of patterns around Japanese windows and screens. The soft,

diffuse light transmitted by the shoji warms each room, and enhances the richness of the woods. Through an alternation of colors and textures a rhythm of wood, straw mats, and bamboo is established throughout the house. As in the garden, the materials found in the house are carefully considered and chosen before they are placed within the building. The limitations of each material have been known and respected by the architect. Within the context of this respect and appreciation of materials, the architect and the gardener play these objects one against another to create an environment, whether interior or exterior, which can never be dull or static. The subtle changes in natural hues and textures found in the interior of a Japanese house, create an atmosphere which is refined and relaxed, yet always crips and fresh. For the Japanese house and garden, nature provides vitality and variety as it produces life itself.

The house of the Imperial Roman was man-made, a product of his imagination and technology. The vitality and play which the Japanese found in the grain of wood, the crook of a tree branch were too subtle and too small for the Roman. As the Empire expanded and prospered in the first century A.D. the search for the novel and the lush grew. The palace of Augustus was too conservative for his successors, but it was not only the emperors who sought new and obvious ways for displaying their wealth. The

quest for prominence was clearly manifested in the villas of the wealthy citizens. Glittering mosaics of precious stones and cubes of solid gold covered the most splendid of floors. Skilled craftsmen decorated the walls, and ceilings with elaborate frescoed vistas in brilliant colors, many scenes copied from ancient wall decorations. The most magnificent ceilings were coffered with gold and ivory inlay.[11] In his Domus Aurea, Nero, fascinated with mechanical devices, planned a dining room with a ceiling which opened to shower perfumed flowers down upon his guests. Yet when man could stretch his mind no further, he did turn back to nature. The Roman, in contrast with the Japanese, sought in nature the unnatural, the unusual. In his quest he created forms which were never still and a world which was restless, as the vaults of his villa were restless.

A paradoxical harmony between man and architecture was created in these great Roman vaulted structures. Man was intimately related to the flow of the forms, and yet he was completely overwhelmed by them. His movements, gestures, and actions could be traced in the shape of the vaults and arches. The circular reach of man's spread arms was echoed in the arch of the barrel vaulting of the corridors. The flow of curve into curve suggested the possibility of spaciousness to be filled with movement and

---

[11]Paoli, Ugo Enrico. Rome, Its People, Life and Customs. (New York: David McKay Co., Inc., 1958), pp. 66-67.

activity. The arching of the vaults commanded that the human figure stand tall and reach up and outward in an attempt to touch the structure which surrounded and protected him. Physically, though, the presence of a solitary figure did not disturb the directional force of the vaulting, nor the play of light and shadow on the piers supporting the ceiling. The architecture was massive; it was architecture of a grand and social scale. The Market and Forum of Trajan could be filled only by the gathering of thousands of people. Nero's Domus Transitoria was planned to have united the Domus Tiberiana on the Palatine and the gardens of Maecenas on the Esquiline--a distance of over one thousand meters.[12] In its size the architecture reflected the grandeur of the Roman empire as it had grown and prospered. The wealthy had an insatiable desire to build and to fill the finished building with whatever money could buy. In this frenzy to build, the concept of the individual an an entity, was forgotten. Against the background of mosaics and frescoes, man in his white toga appeared drab. In this formalized public attire he could not compete with the freedom in color and design permitted in architectural interior space. As an individual even the emperor was subjugated by the architectural magnificence which surrounded him.

---

[12]McDonald William Lloyd. The Architecture of the Roman Empire, (New Haven and London: Yale University Press, 1965), p. 27.

As the Roman citizen was slowly overpowered by his material possessions and his display of wealth, the Japanese aristocrat of the Heian periods retreated even further from the realities of the world. He enveloped himself in an idealized existance rooted in the beliefs of Shinto and later those of Zen Buddhism. To the Japanese aristocrat the world was merely a fragment of existance and man should endeavor to live pleasantly and comfortably.[13] The house reflected this sensitivity to man and to nature and was developed in consideration of man as an integral member of the design. The presence of man is necessary to complete a Japanese room; without him it is empty. He lends color and spirit to the room. Although the house and gardens are frequently expansive their scale is intimate. In a seated position a man is completely at ease within a room. The levels of the shoji, the paintings on screens, the height of the ceiling are intentionally low, creating a sense of physical conformity of the building structure to the seated figure within the room. A single figure will fill a room, but a dozen people will not crowd it. The house opens as it is filled with people. The interior space is uncluttered by furniture and display. The tokonoma[14] is never entered and

---

[13]Again from the writings of Yoshida Kenko, "Though this world be but a temporary house, yet is pleasant and interesting to build an agreeable dwelling suited to the life of this world." See Yoshida, cited above, p. 18.

[14]The tokonoma is a sacred, recessed area in a Japanese room. See Yoshida, cited above, p. 98. See also Morse, cited above, pp. 133-149.

remains always open and free, intimating a spaciousness the solid wall prohibits. A rightness of scale is established between the interior and the exterior spaces. Nothing is overwhelmed in a grand gesture of space. There is instead, an implied progression of scale and space conceived around the seated figure and presented to the human imagination to be completed.

The mind was to be developed, to be trained to seek perfection in a search for beauty through meditation. The mind was to be kept free of worldly considerations, and the imagination was encouraged. The Japanese house and gardens in scale and refinement of detail reflect this discipline. A Japanese house or garden was not designed to fulfill this search for beauty, but was rather intended to provide a place in which man could find comfort and could compose himself and his mind for contemplation. Each object in the house and garden was chosen as an offering to the imagination. The object itself was less important than what it suggested to the mind. The importance of suggestion is exemplified in the arrangement of elements in the Ryoanji Garden. The fifteen rocks of the garden are simple, yet they are permeated with a certain mystery. The arrangement of the rocks does not force upon the mind only one pattern or relationship of shapes. When seen literally the arrangement may mean nothing, but when seen with imagination it can mean

everything. The interpretation of the garden is infinite, open to every possibility.[15] Thus the Japanese house and garden are open to every possibility. The free-flow of forms embodies both a physical and a mental freedom. Physically a room can be opened, closed, or somewhere in between. The juxtaposition of shapes can appear mentally surprising or curious, but the combination is never without resolution when contemplated. There are no unrelated transitions in form which disturb or tease the mind. A unity of purpose and freedom which soothe the mind prevails throughout the house and garden plan.

A sense of unity also prevails throughout the architectural forms of Imperial Rome. The physical grandeur and the repetition of forms visually pulls the structure together. The mind is at first delighted by the richness of interior surfaces and seemingly endless progression of forms as the individual moves through a series of spaces complete within themselves. Soon, though, the eye cries for a rest and the mind is weary. The glittering surfaces of the walls and the great vaulted spaces have tricked the imagination. The spaciousness of the structure implies a freedom it does not possess. Man has not moved freely but has been forcibly drawn by the axial direction of the

---

[15]To the Japanese, this would seem to exclude all that is man-made and of perishable values. For a further discussion of the Ryoanji Gardens see Gropius, cited above, p. 6.

corridor from one vaulted area to another. The dim niches and screens of columns created tangential views and unresolved vistas which forced the eye away from the central axis of the corridors, but could not free the mind. Man was not meant to stop and meditate as he passed through the building; nor did the restlessness of the forms suggest that he might stop. The arched forms, and patterns of light and shadow possessed a kinetic energy from which there was no escape. At no point was the structure calm, at ease with itself, or with man. The spaces were not really created for the comfort of man, and they were complete without him. Empty, these spaces existed as geometrically and mathematically whole, structures which did not mock man, but simply ignored him.

Roman imagination and technology culminated in the Pantheon. Even now, as it stands with its Renaissance touches, the building embodies the complexities of Roman life and the transistions which were occurring in traditional ways of thought. The structure of the Pantheon is an architectural achievement exposing the confusion which was enveloping a civilization that did not know how to save itself from destruction. The interior of the building is vast. A great coffered dome arches overhead, creating spinning geometric patterns which never rest. An ever-shifting light from the oculus pulls and pushes on the niches in the walls. Man, on entering, is reduced to

utter insignificance. Under the center of the dome the spinning spaces are still, but even here a single man could not relate to the enormity of the structure. Only masses of people could begin to fill such vast space. Only ceremony and splendor were right in so magnificent an architectural creation. The sense that Rome, ruled by a demigod, was the center of the universe has been architecturally fulfilled in the creation of the Pantheon, and is symbolized in the great dome. The dome of the Pantheon was the dome of heaven and heaven was the dome of the Empire.

Japanese architecture has no culmination but rather a beginning to which all sense of space and form can be traced. The Shinto Shrine of Ise is manifestation of the ideals which are sought in each Japanese building. The structure of Ise is simple in form, complex in detail as nature is both simple and complex. The structure displays an exquisite sensitivity to materials and maintains a tradition established in the original building.[16] Each component is perfect in detail and as a part of the whole. Nothing is superfluous, nothing is lacking. Harmony prevails throughout, yet the building is not static. It is filled with a subtle sense of life, and is yet removed from life. It is pervaded with the same mystery which engulfs

---

[16]Concerning the ceremonial rebuilding of Ise see Gropius, cited above.

Ryoanji. The ways of Shinto taught the Japanese to find pleasure and beauty in nature as the home of the gods. Through Zen Buddhism, the mind was trained to be sensitive and diligent in the search for truth and beauty. In architecture the search for truth and beauty in form ended in Ise.

ILLUSTRATIONS

GENERAL PLAN of KATSURA

GENERAL PLAN of KATSURA

General Plan of Katsura

1. Front Gate
2. Imperial Gate
3. Imperial Approach
4. Suminoe Pine
5. Central Gate
6. Old Shoin
7. Middle Shoin
8. Music Room
9. New Palace
10. Riding Ground
11. Gepparo
12. Maple Mountain
13. Momiji Stable
14. Stetsu Mountain
15. Outside Resting Place
16. Outside of Bamboo-Grove Pavilion
17. Shore
18. Waterfall
19. Amanoshashidate
20. Running Water for Washing Hands
21. Shôkin-tei
22. Island of Immortals
23. Valley of Fireflies
24. Shoka-tei
25. Onrindo
26. Shoiken
27. Boathouse
28. Ordinary Gate
29. Katsura River

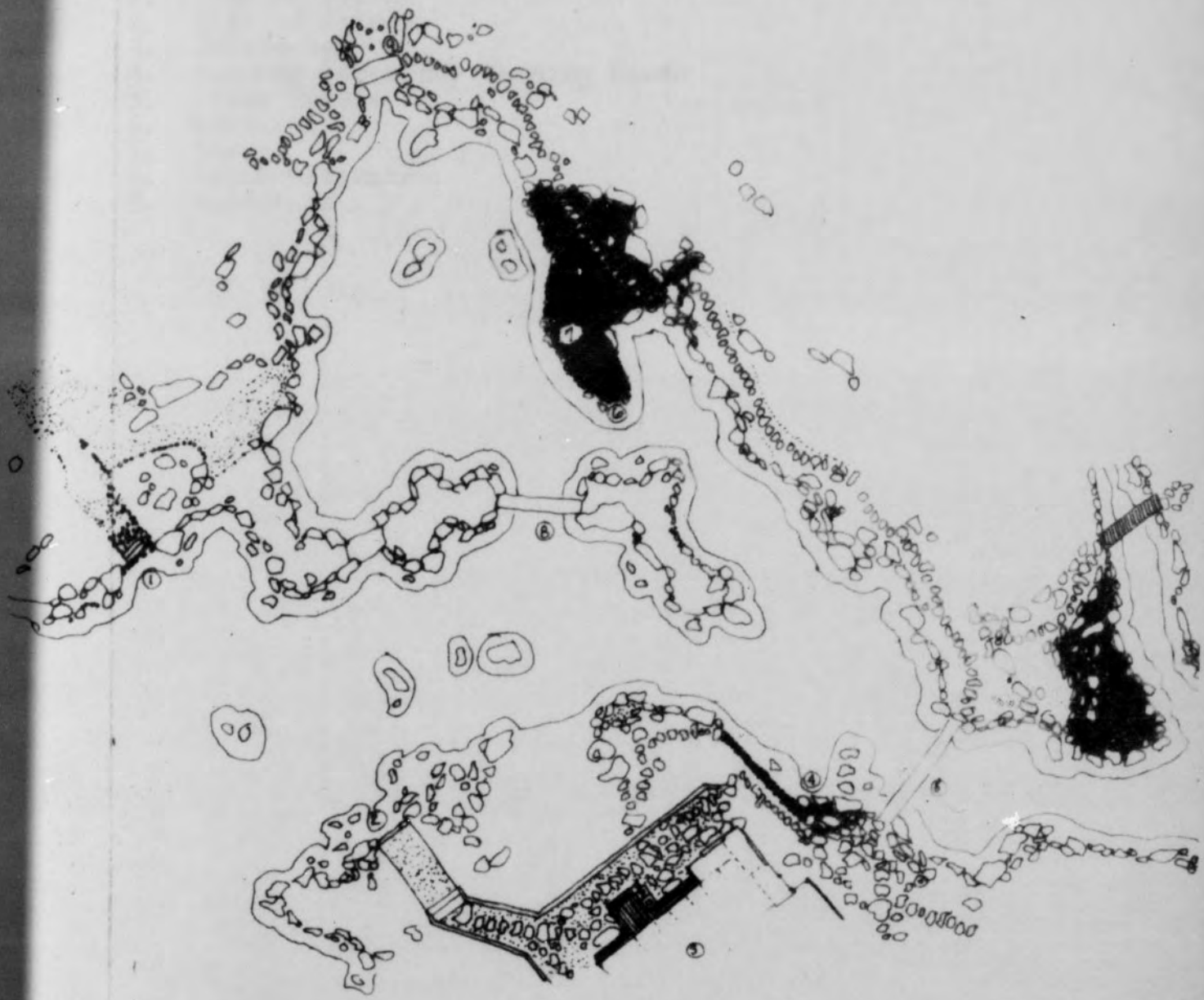
INTERIOR of SHOIN BUILDINGS

INTERIOR of SHOIN BUILDINGS

Gropius

Interior of Shoin Buildings

1. Central Gate
2. Earthen Bridge
3. Entrance
4. Imperial Carriage Stop
5. Room with Wooden Floor
6. Pantry
7. Spear Room
8. Veranda with Tatami
9. Second Room (Old Shoin)
10. First Room
11. Room with Hearth
12. Hearth
13. Anteroom
14. Third Room (Middle Shoin)
15. Second Room
16. First Room
17. Shelves
18. Veranda with Tatami
19. Women's Bath
20. Tokonoma Alcove
21. Music Room
22. Pantry
23. Second Room (New Palace)
24. First Room
25. Place of Honor
26. Imperial Bedroom
27. Dressing Room
28. Lavatory
29. Bath
30. Storeroom
31. Gepparo
32. Moon-viewing Platform
33. Moss Garden
34. Lawn

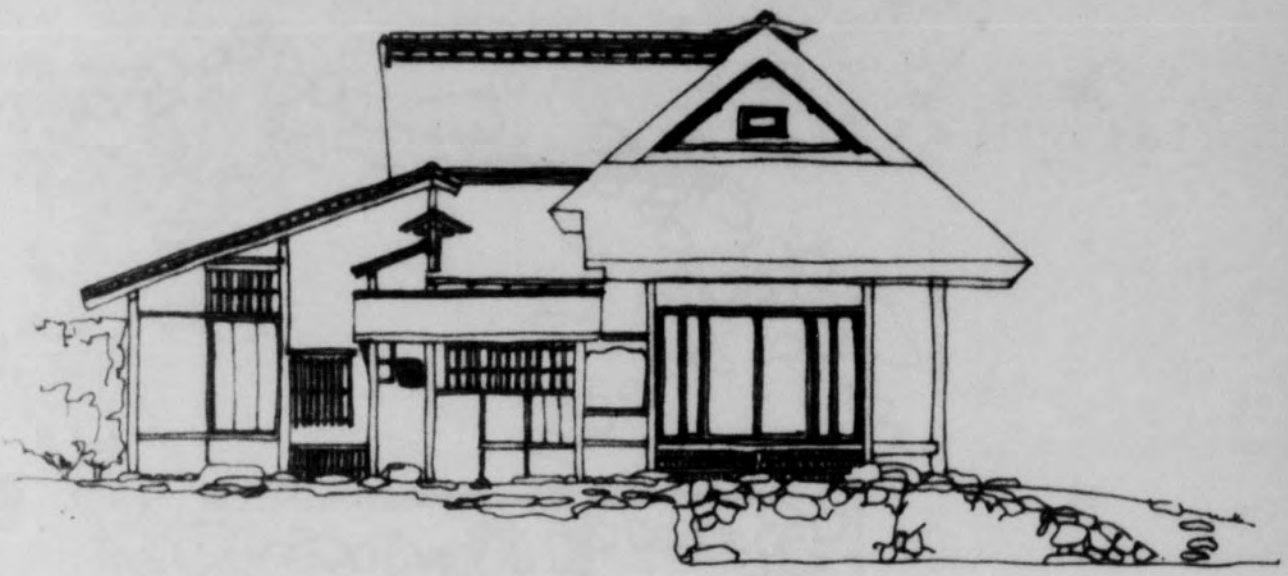


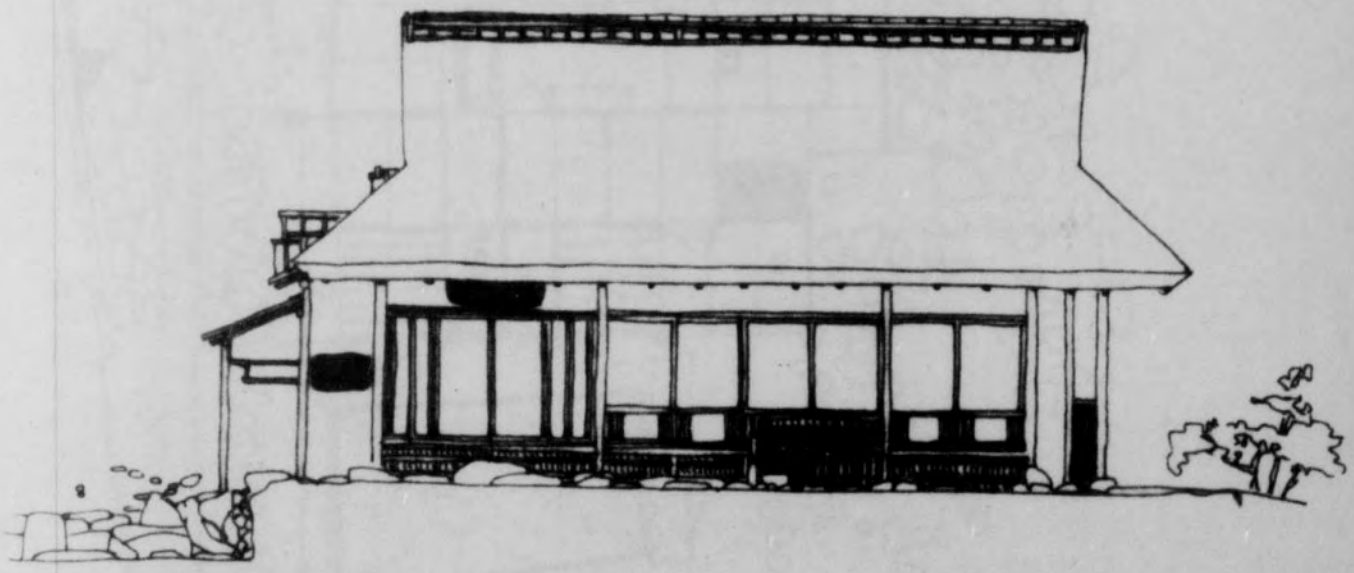
APPROACH to SHÔKIN-TEI

Gropius

Approach to Shôkin-Tei

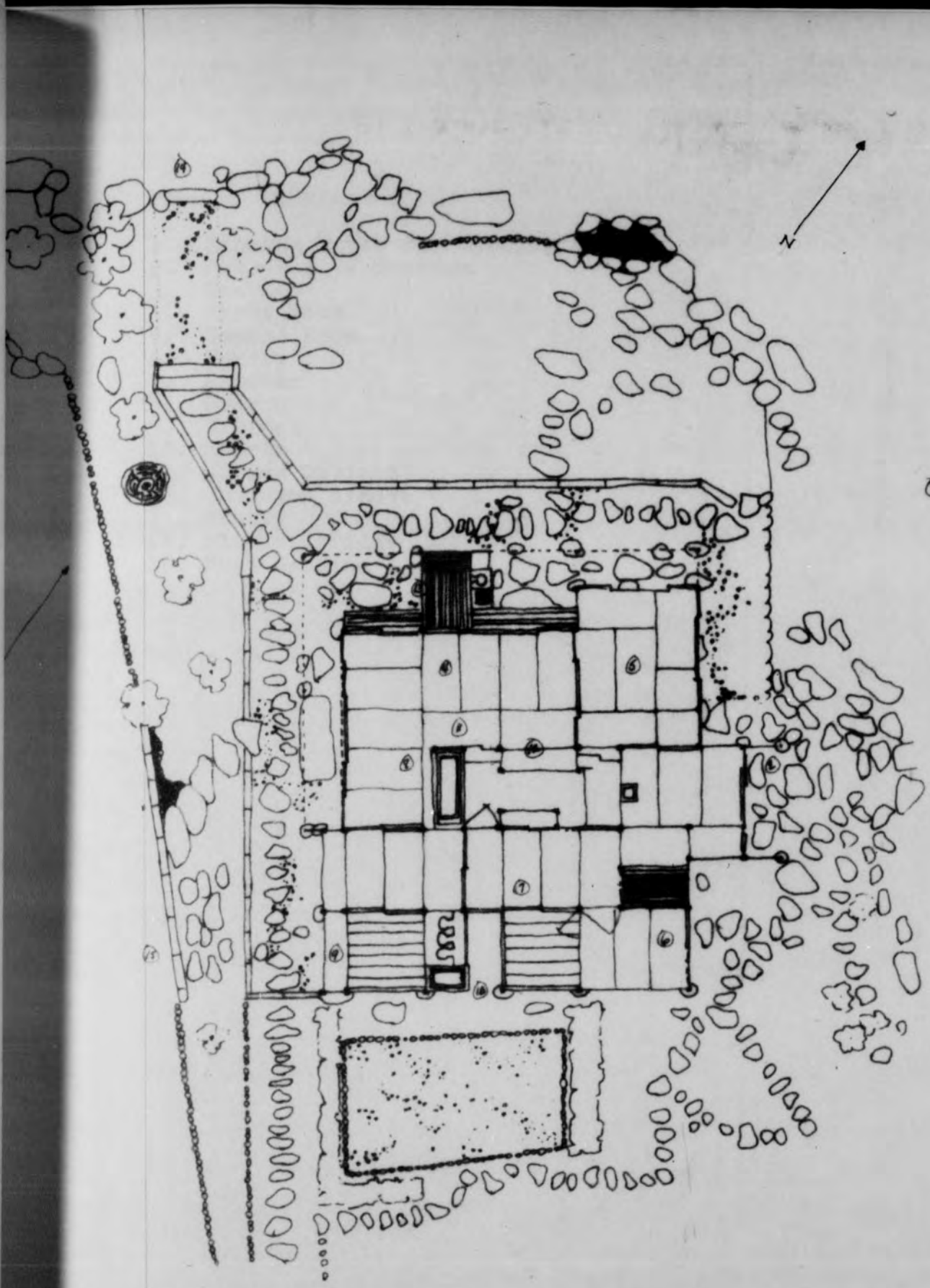
1. Site of Bridge
2. Site of Bridge
3. Shôkin-tei
4. Running Water for Washing Hands
5. Stone Bridge
6. Lantern
7. Shore
8. Amanohashidate
9. Waterfall





EXTERIOR PLAN of SHÔKIN-TEI scale 1:150

Blaser.

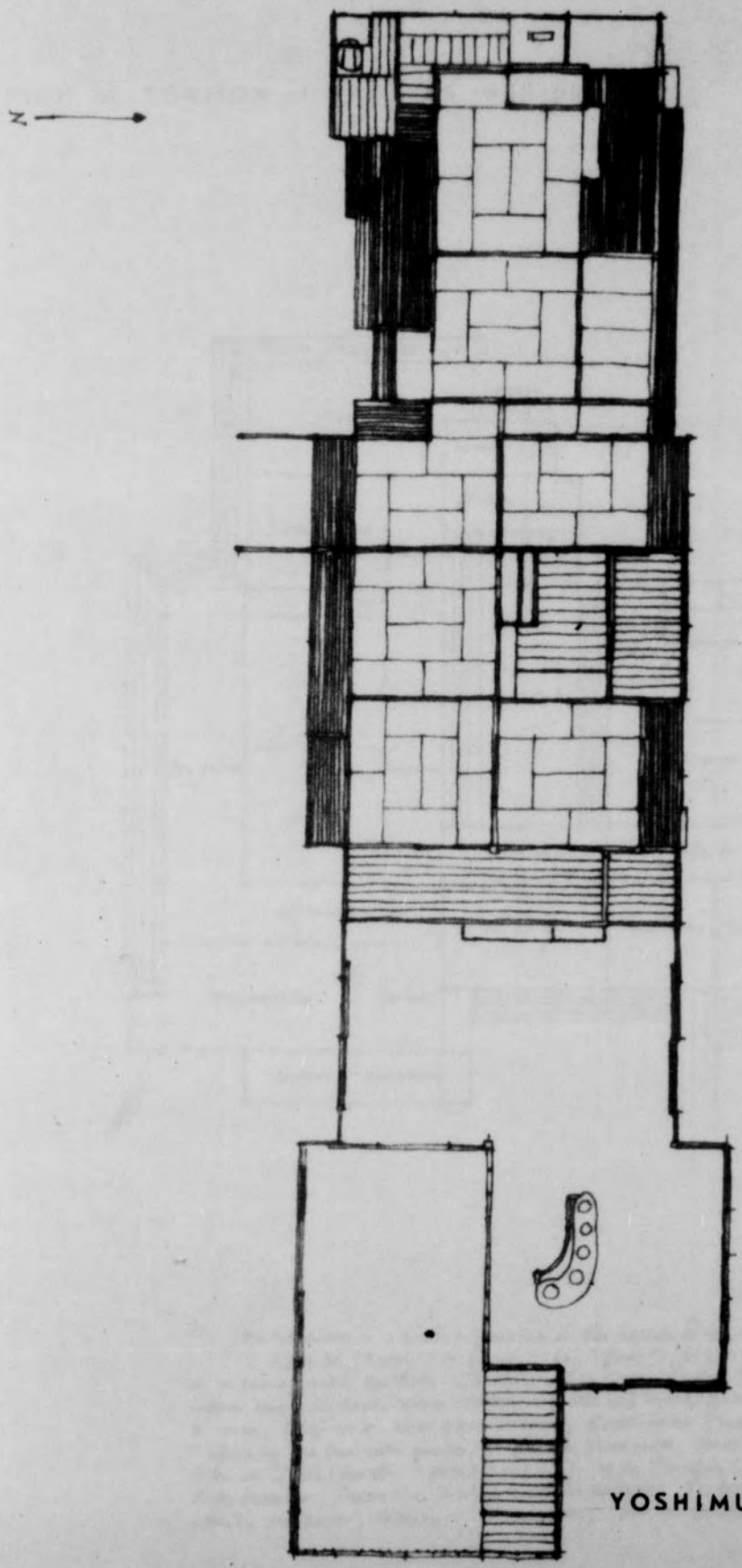


INTERIOR PLAN of SHÔKIN-TEI scale 1:150

Blaser

Plan of Shôkin-tei

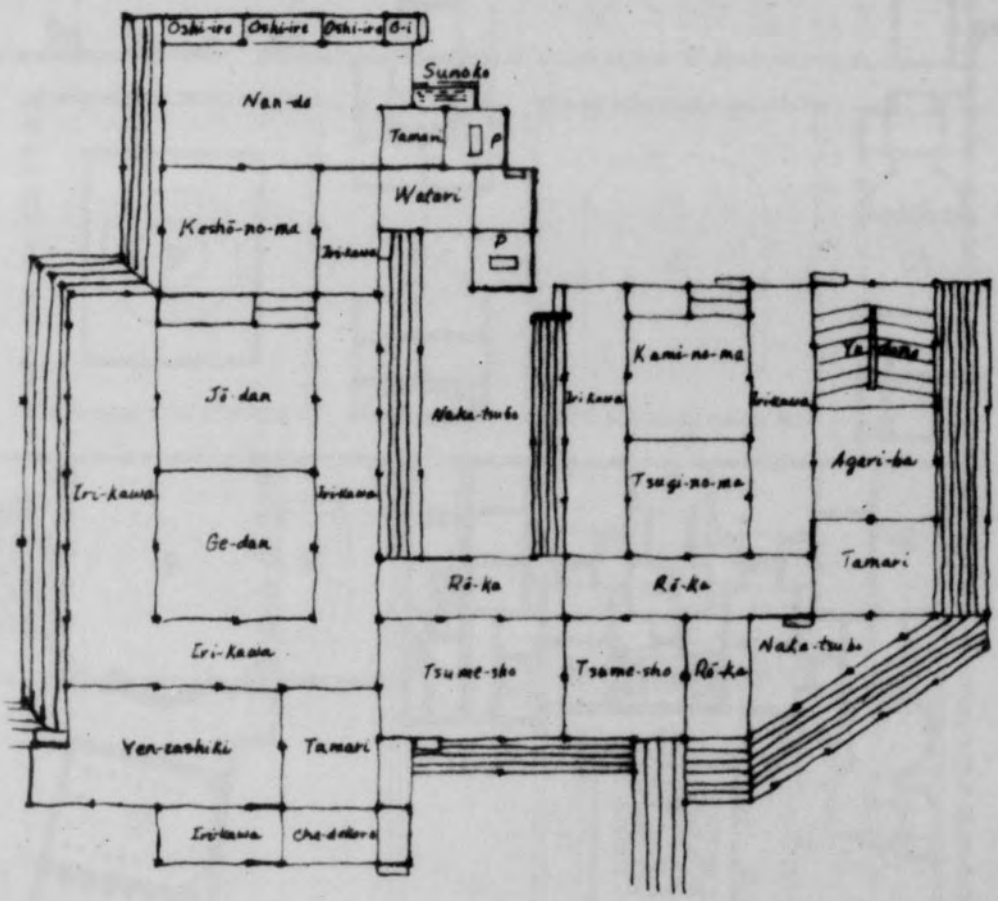
1. Running Water for Washing Hands
2. Entrance to Tearoom
3. Tearoom
4. First Room
5. Second Room
6. Pantry
7. Kitchen
8. Hearth
9. Cabinet
10. Hearth
11. Closed Cabinet
12. Tokonoma Alcove
13. Pantry
14. Site of Bridge
15. Boat Landing



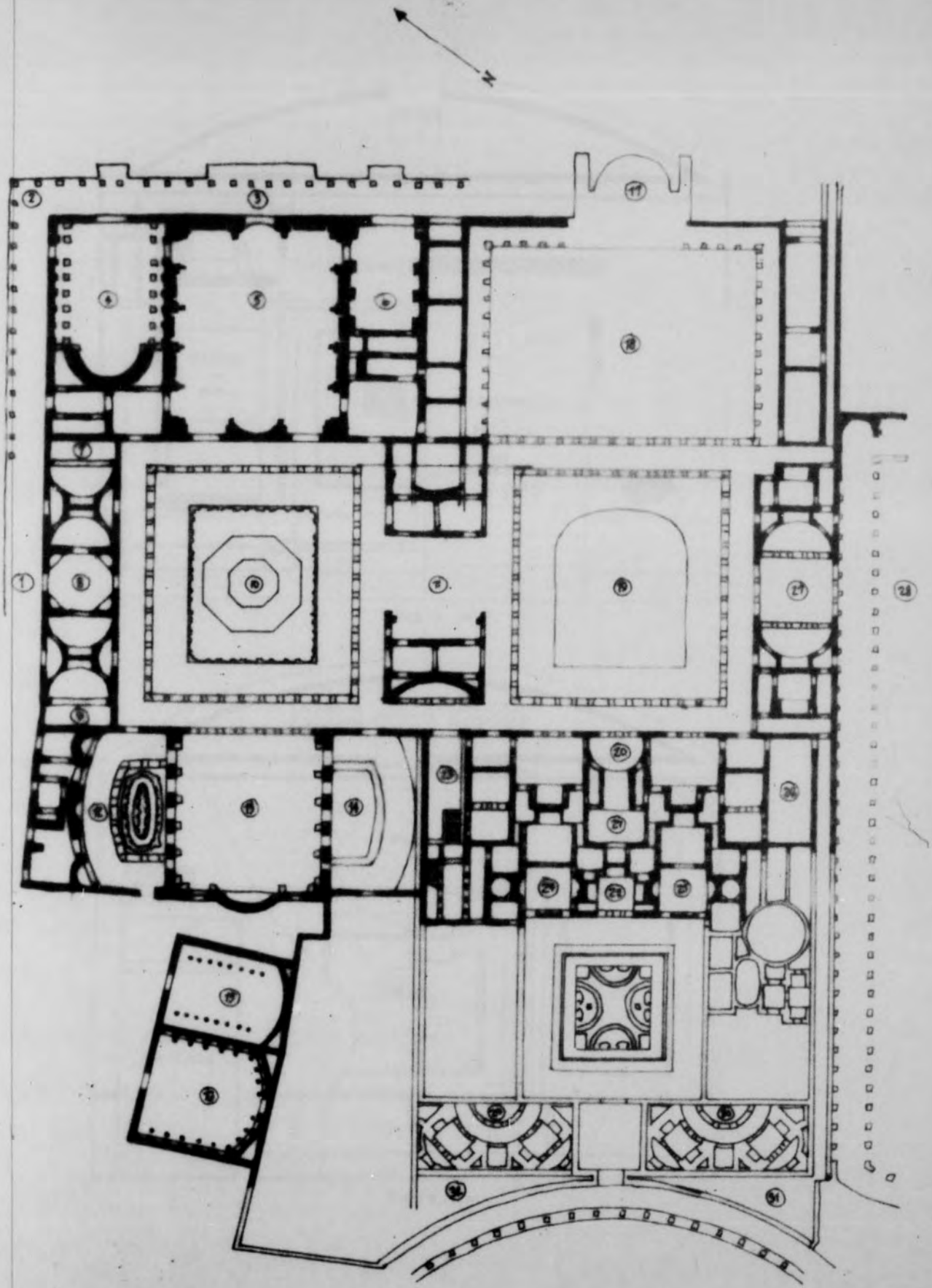
YOSHIMURA-TEI

Blaser

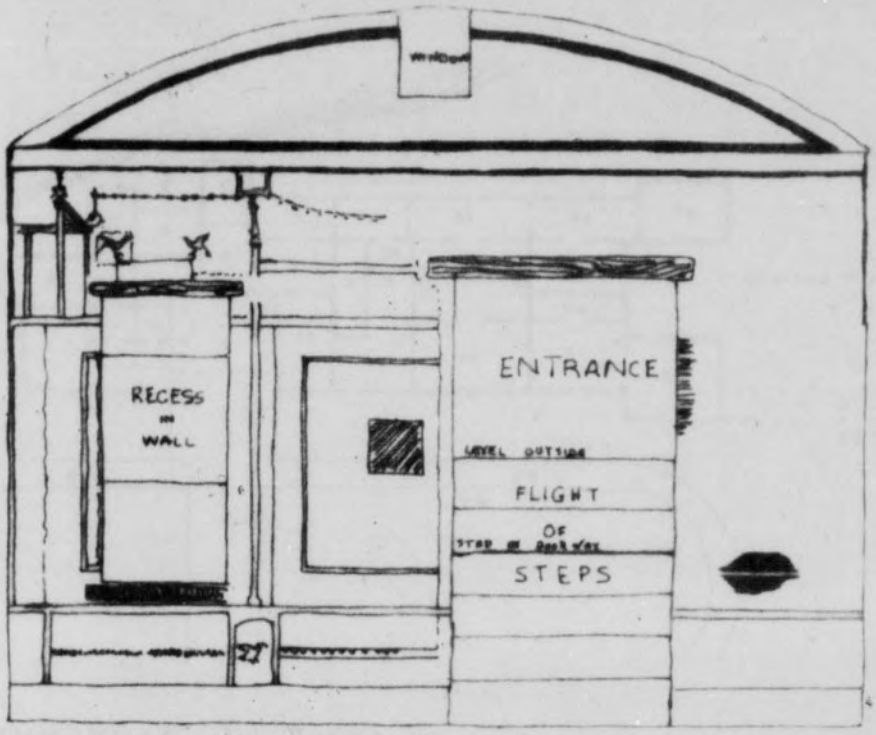
PLAN of PORTION of DAIMIO'S RESIDENCE



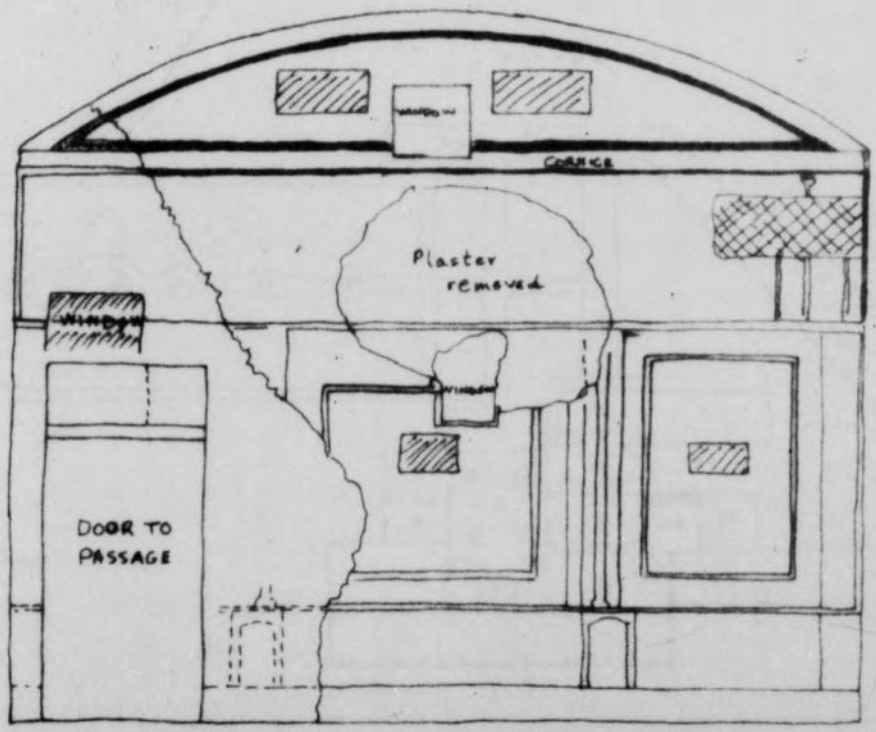
The following is a brief explanation of the names of the rooms given in plan: Ageri-ba (Ageri, "to go up;" ba, "place"), Platform, or place to stand on in coming out of the Bath. Cha-dokoro, Tea-place; Ge-dan, Lower Step; Jō-dan, Upper Step; Iri-kawa, Space between verandah and room; Kami-no-ma, Upper place or room; Tsugi-no-ma, Next place or room; Koshō-no-ma, Dressing-room (Koshō, — "adorning the face with powder"). Nan-do, Store-room; Naka-tsubo, Middle space; Oshi-ire, Closet (literally, "push," "put in"); Rō-ka, Corridor, Covered way; Tamari, Ante-chamber; Tsume-sho, Waiting-room for servants; Yu-dono, Bath-room; Yen-zashiki, End parlor; Watari, — "to cross over;" Sunoko, Bamboo shelf or platform.



PLAN of UPPER LEVEL of DOMITIAN'S PALACE

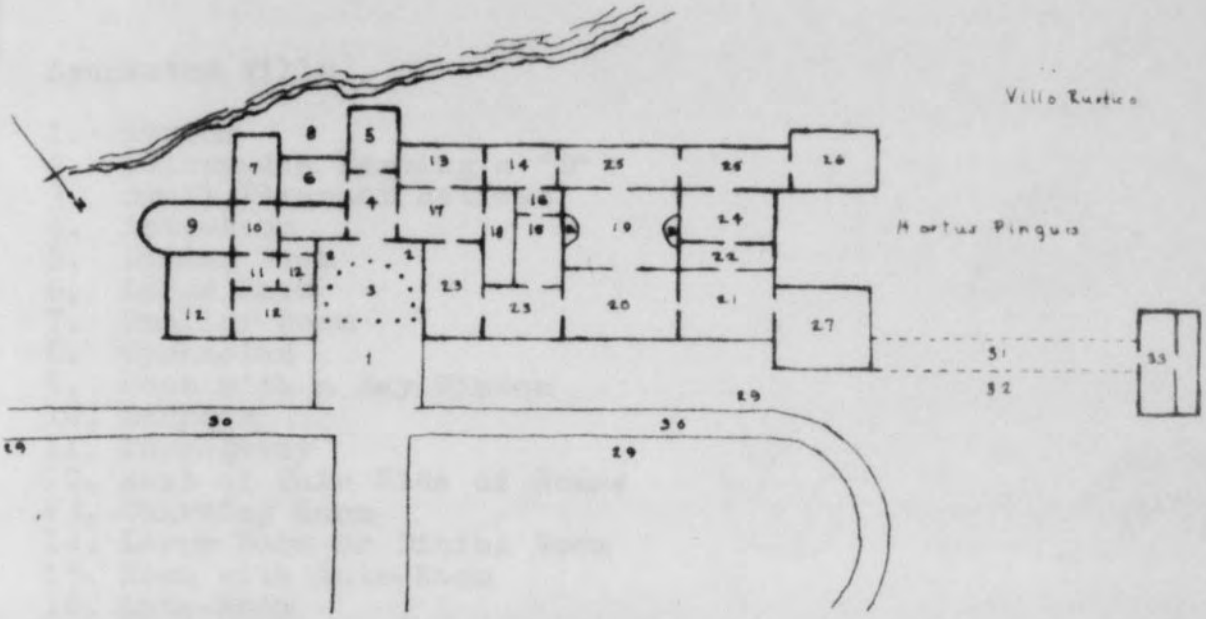


NORTH WALL

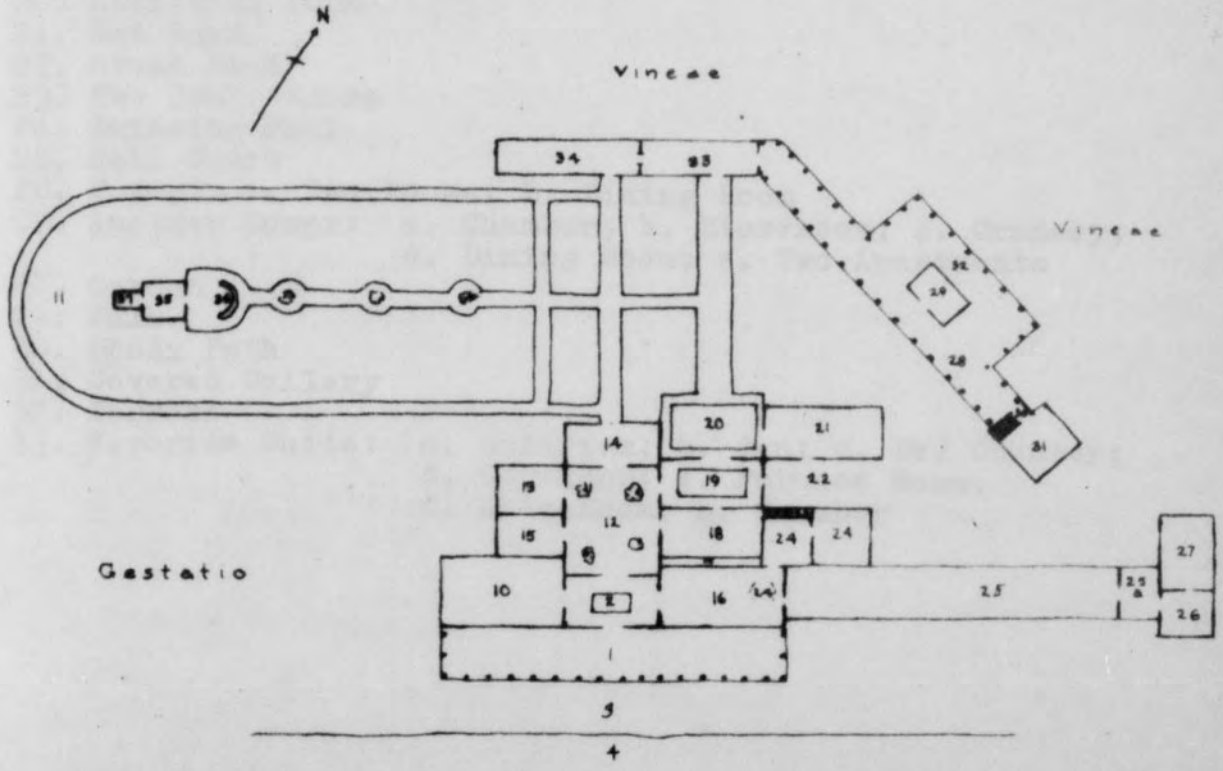


SOUTH WALL

HOUSE of POLLIO



LAURENTUM VILLA, plan, Tanzer **pl 40**



TUSCAN VILLA, plan, Tanzer **pl 56**

Laurentum Villa

1. Atrium
2. Colommades Forming a "D"
3. Small Pleasant Retreat
4. Ante-Room
5. Dining Room
6. Large Room
7. Smaller Room
8. Gymnasium
9. Room with a Bay Window
10. Bedroom
11. Passageway
12. Rest of This Side of House
13. Charming Room
14. Large Room or Dining Room
15. Room with Ante-Room
16. Ante-Room
17. Another Room with Ante-Room
18. Ante-Room
19. a. Duo-Bathrooms: Cold Room with Two Plunge Baths
20. Anointing Room
21. Hot Room
22. Steam Room
23. Two Small Rooms
24. Swimming Pool
25. Ball Court
26. Tower: a. Two Rooms; b. Dining Room
27. Another Tower: a. Chamber; b. Storeroom; c. Granary; d. Dining Room; e. Two Apartments
28. Garden
29. Walk
30. Shady Path
31. Covered Gallery
32. Terrace
33. Favorite Suite: a. Solarium; b. den; c. Bed Chamber; d. Corridor; e. Furnace Room; f. Ante-Room; g. Chamber

Tuscan Villa

1. Porch
2. Atrium
3. Terrace
4. Bank
5. Walk
6. Driveway
7. Meadow
8. Fields
9. Meadow Planted with Trees
10. Dining Room
11. Park
12. Small Court
13. Sleeping Alcove
14. Private Dining Room
15. Another Chamber
16. Large Chamber
17. Hypocaust
18. Dressing Room
19. Swimming Pool
20. Outdoor Pool
21. Warm Room
22. Gymnasium
23. Stairs
24. Three Apartments
25. Gallery
26. Chamber
27. Sitting Room
28. Covered Colonnade
29. Dining Room
30. Stairs
31. Chamber
32. Porch
33. Two Apartments (3 Rooms)
34. Two Apartments (4 Rooms)
35. Chamber Opposite Marble Bench
36. Marble Bench
37. Small Alcove

Tanzer, p. 108

BIBLIOGRAPHY

Arnheim, Rudolph, Wolfgang M. Zucker, and Joseph Watterson. "Inside and Outside in Architecture: A Symposium," JAAC, Vol. XXV, No. 1 (Fall 1966), pp. 3-15.

Aronin, Jeffrey Ellis. Climate and Architecture. New York: Reinhold Publishing Corp., 1953.

Blaser, Werner. Structure and Form in Japan: Architectural Reflections. Scarsdale, N. Y.: Wittenborn and Co., 1963.

Böethius, Axel. The Golden House of Nero: Some Aspects of Roman Architecture. Ann Arbor: The University of Michigan Press, 1960.

Carver, Norman F., Jr. Form and Space in Japanese Architecture. Tokyo: Shokokusha Publishing Co., 1955.

Clark, Eleanor. Rome and a Villa. Garden City, N. Y.: Doubleday, 1952.

Davis, William Stearns. The Influence of Wealth in Imperial Rome. New York: The Mac Millian Co., 1910.

Drexler, Arthur. The Architecture of Japan. New York: The Museum of Modern Art, 1955.

Gropius, Walter, Kenzo Tange, and Yasuhiro Ishimoto. Katsura, Tradition and Creation in Japanese Architecture. New Haven: Yale University Press, 1960.

Günther, R. T. Pausilypon. Printed by Horace Hart for the Author at the University Press, Oxford, 1913.

Harada, Jiro. The Lesson of Japanese Architecture. London: The Studio, Ltd., 1936.

Kishida, Hideto. Japanese Architecture. Tokyo: Japanese Travel Bureau, 1959.

Kuck, Loraine E. The Art of Japanese Gardens. New York: The John Day Co., 1940.

McDonald, William Lloyd. The Architecture of the Roman Empire. New Haven and London: Yale University Press, 1965.

Morse, Edward S. Japanese Homes and Their Surroundings. New York: Dover Publications, 1916.

Nash, Ernest. Roman Towns. New York: J. J. Augustin Publisher, 1944.

Nourse, Mary A. Kodo: The Way of the Emperor. New York: The Bobbs-Merrill Co., 1940.

Paoli, Ugo Enrico. Rome, Its People, Life, and Customs. New York: David McKay Co., Inc., 1958.

Scott, Adolphe Clarence. The Flower and Willow World. Orion Press, 1960.

Street, Julian. Mysterious Japan. New York: Doubleday, Page, and Co., 1922.

Tange, Kenzo, and Noboru Kawazoe. Ise, Prototype of Japanese Architecture. Cambridge, Mass: M. I. T. Press, 1965.

Tanzer, Helen H. The Villas of Pliny the Younger. New York: Columbia University Press, 1924.

Vitruvius. The Ten Books on Architecture. Morris Morgan, trans. Cambridge: Harvard University Press, 1926.

Yazake, Takeo. The Japanese City: A Sociological Analysis Tokyo: Japan Publications Trading Co., 1963.

Yoshida, Tetsuro. The Japanese House and Gardens. New York: Frederick A. Praeger, 1955.

Zevi, Bruno. "Architecture as Space," Art and Philosophy. W. E. Kennick, ed. New York: St. Martin's Press, 1964, pp. 239-247.